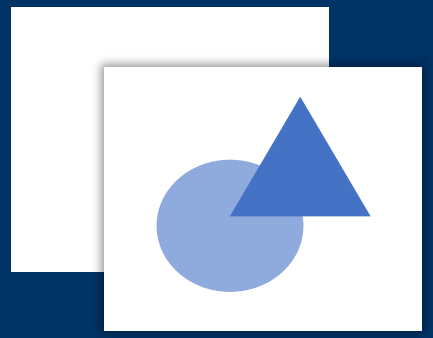
Modern UI/UX with LabVIEW



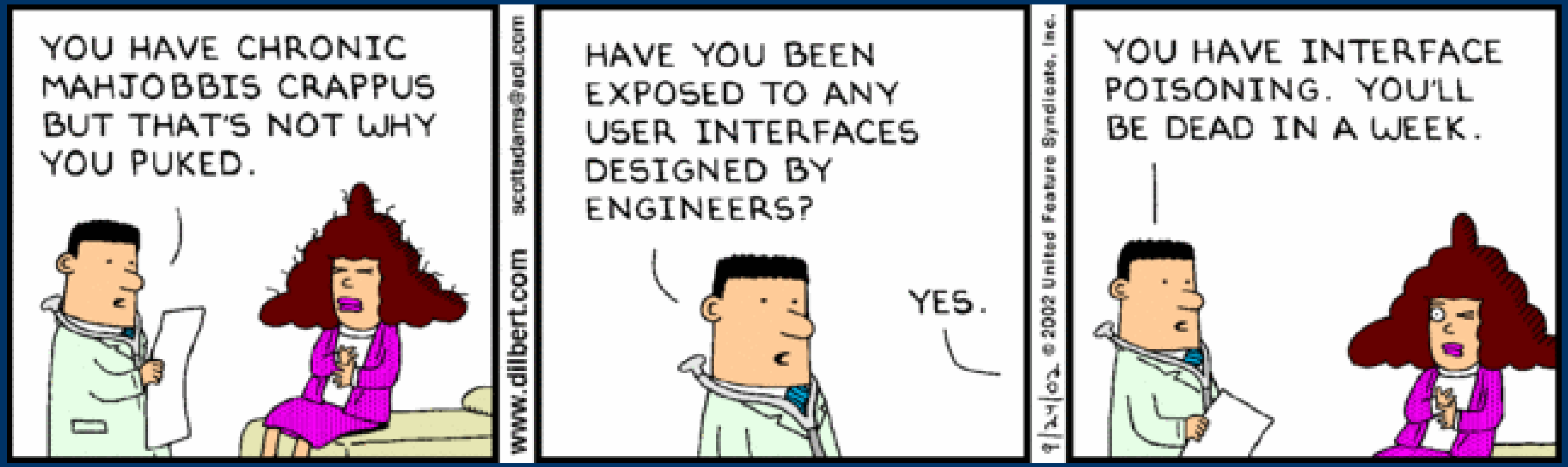
Steve Ball

September 26, 2019

CLA Summit Americas

Composed SYSTEMS

The Problem


YOU HAVE CHRONIC MAHJOBBIS CRAPPUS BUT THAT'S NOT WHY YOU PUKED.
www.dilbert.com scottadams@aol.com
HAVE YOU BEEN EXPOSED TO ANY USER INTERFACES DESIGNED BY ENGINEERS?
YES.
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YOU HAVE INTERFACE POISONING. YOU'LL BE DEAD IN A WEEK.

Agenda:

Definitions

Misconceptions

Golden Rules

Material Design

LabVIEW

Why should we care about UI/UX?

What is User Experience?

User experience refers to the singular and accumulated experiences that occur for users as a consequence of them interacting with an object in a given context.

– **Calgar Araz**
UX @LEGO

Definitions

Misconceptions

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LabVIEW

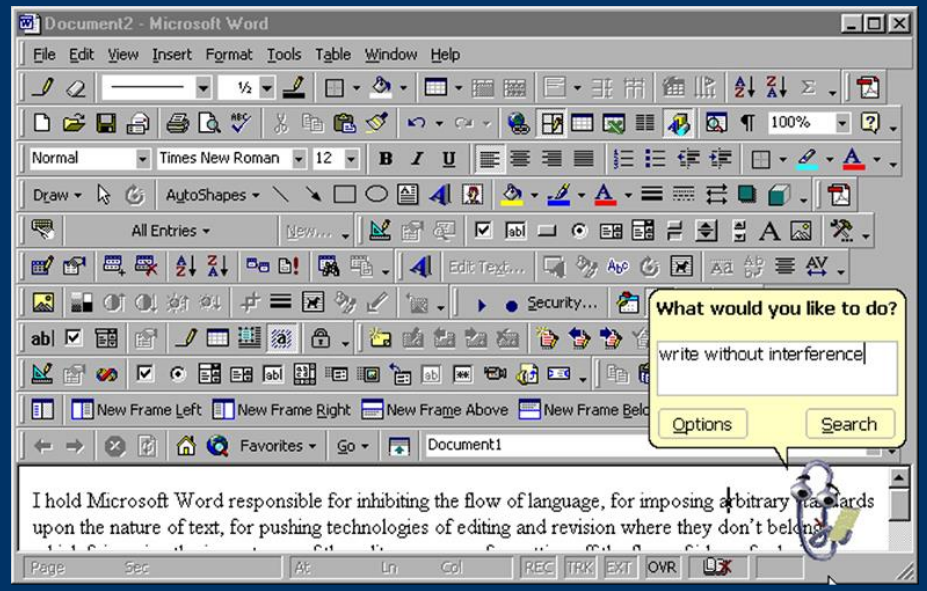
UI/UX misconceptions

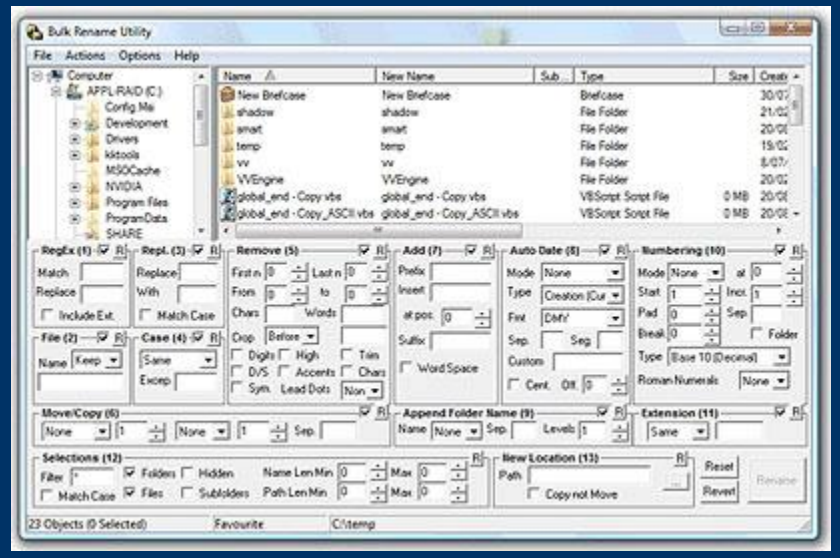
Cool/Fancy is better

Consistency > Eye Candy

UI/UX misconceptions

My user/client wants to see everything at the same time!

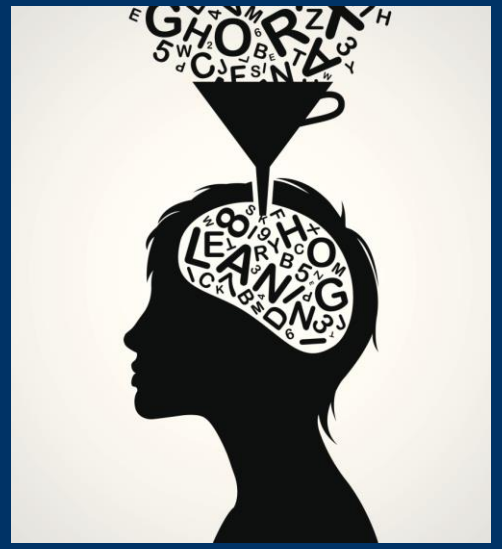




10 simple views are better than 1 cluttered view

UI/UX misconceptions

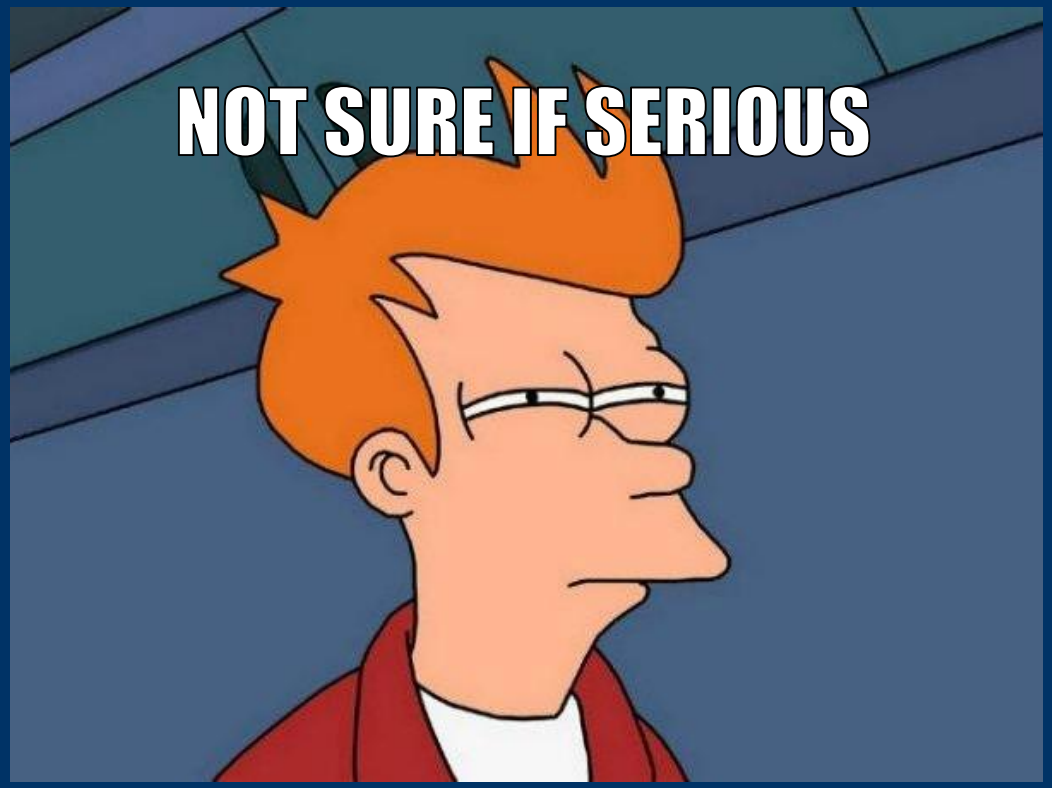
My user/client won’t pay for good UI/UX!



With mindful practice and prebuilt components, development time impacts are minimized

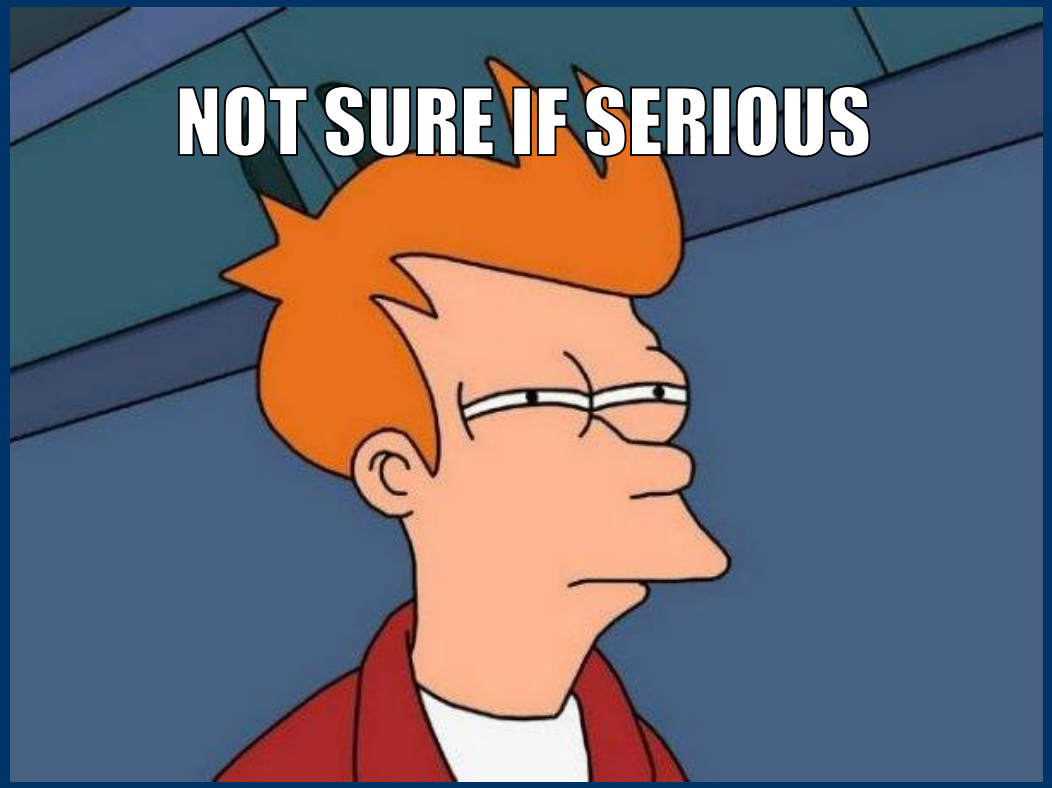
UI/UX misconceptions

“This is a LabVIEW application, we don’t need to follow industry best practices”



UI/UX misconceptions

“My organization uses a large/legacy codebase and there is no way we could make meaningful changes”



Definitions

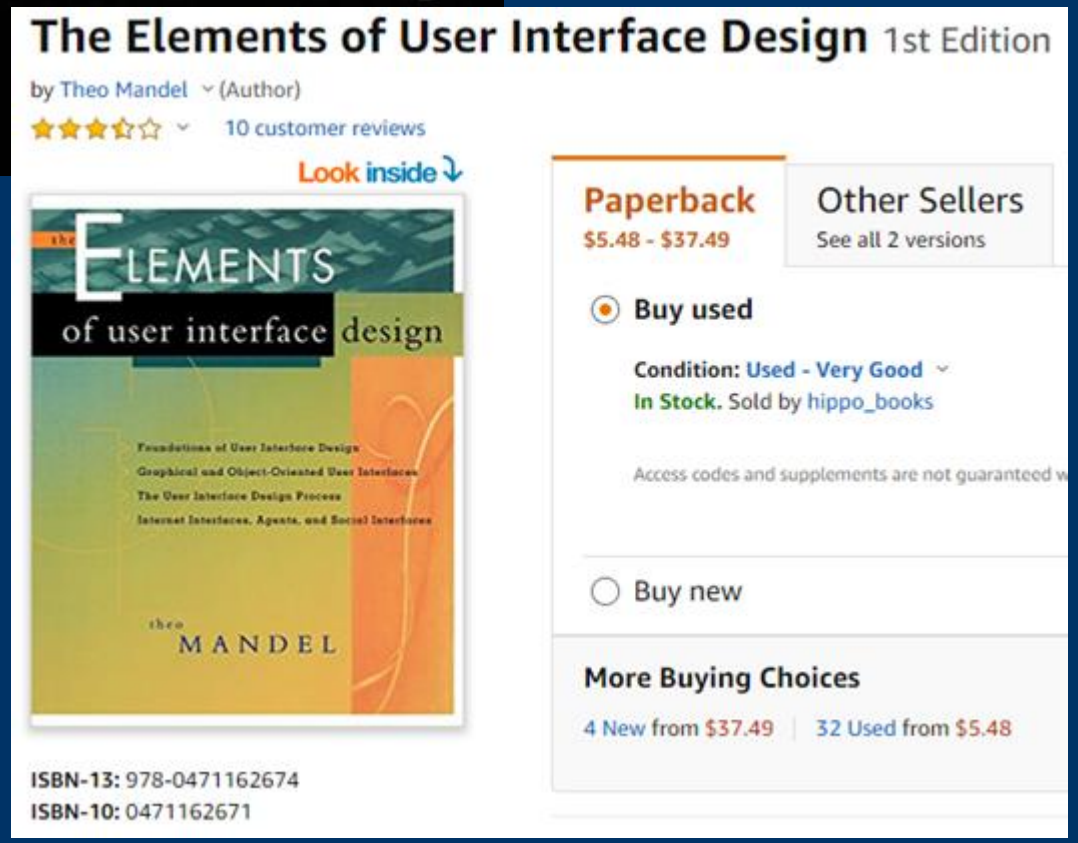
Misconceptions

Golden Rules

Material Design

LabVIEW

Theo Mandel PhD
User Experience, Usability, Interface Design and Real World Design


The Elements of User Interface Design 1st Edition
by Theo Mandel (Author)
10 customer reviews
Look inside
the ELEMENTS of user interface design
Foundations of User Interface Design
Graphical and Object-Oriented User Interfaces
The User Interface Design Process
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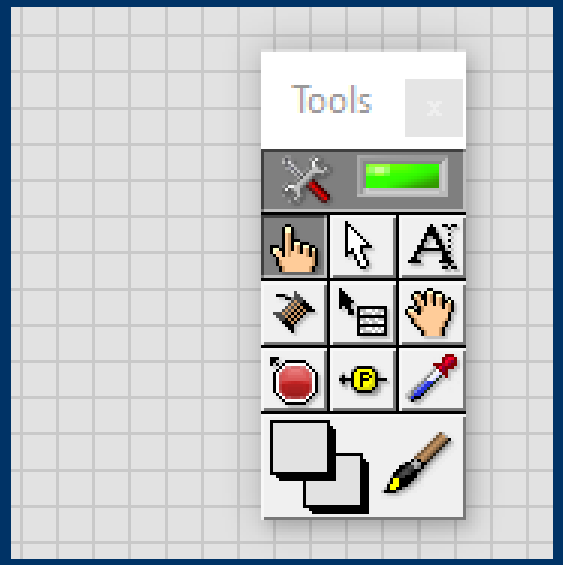
ISBN-10: 0471162671

The Golden Rules of User Interface Design

1. Place the user in control
2. Reduce the user’s memory load
3. Make the user interface consistent

Place the user in control

1. Use **modes** judiciously

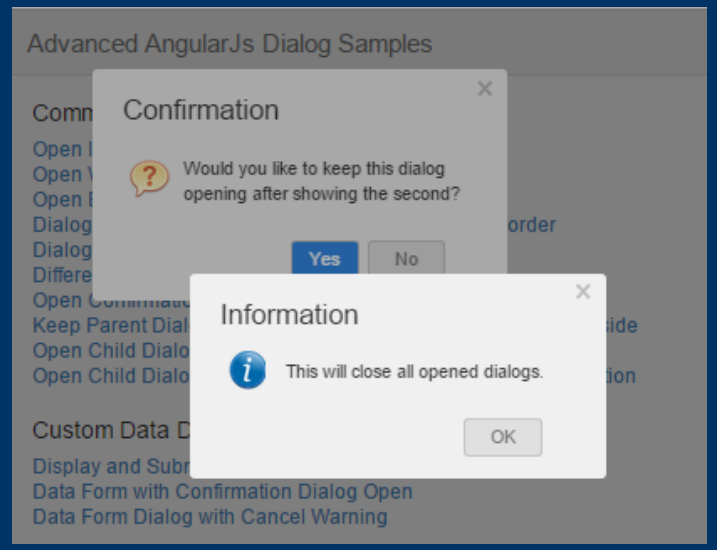


Place the user in control

2. Provide **input flexibility** (keyboard, mouse or touch)

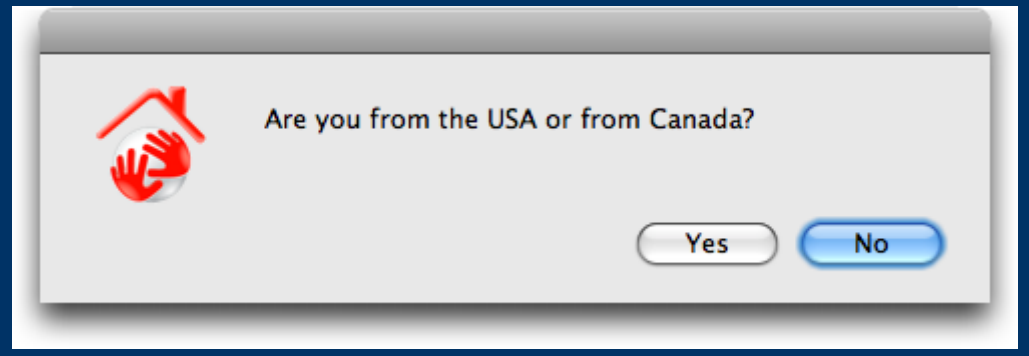
Place the user in control

3. Allow users to change focus



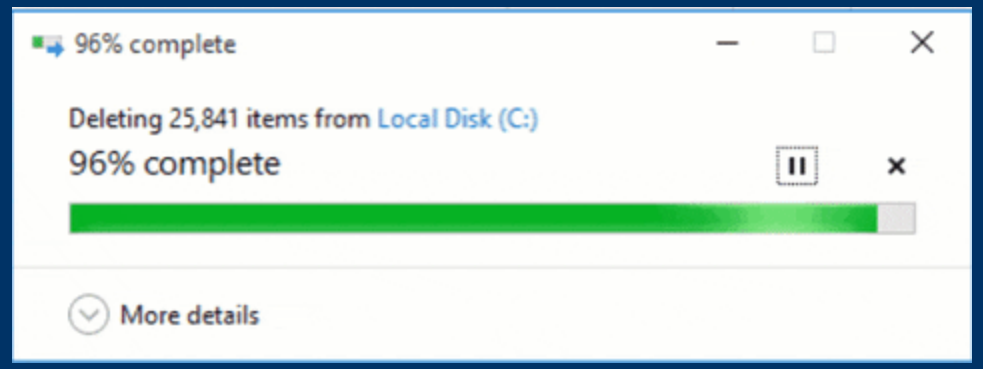
Place the user in control

4. Speak **human**, not machine. Use concise conversational text



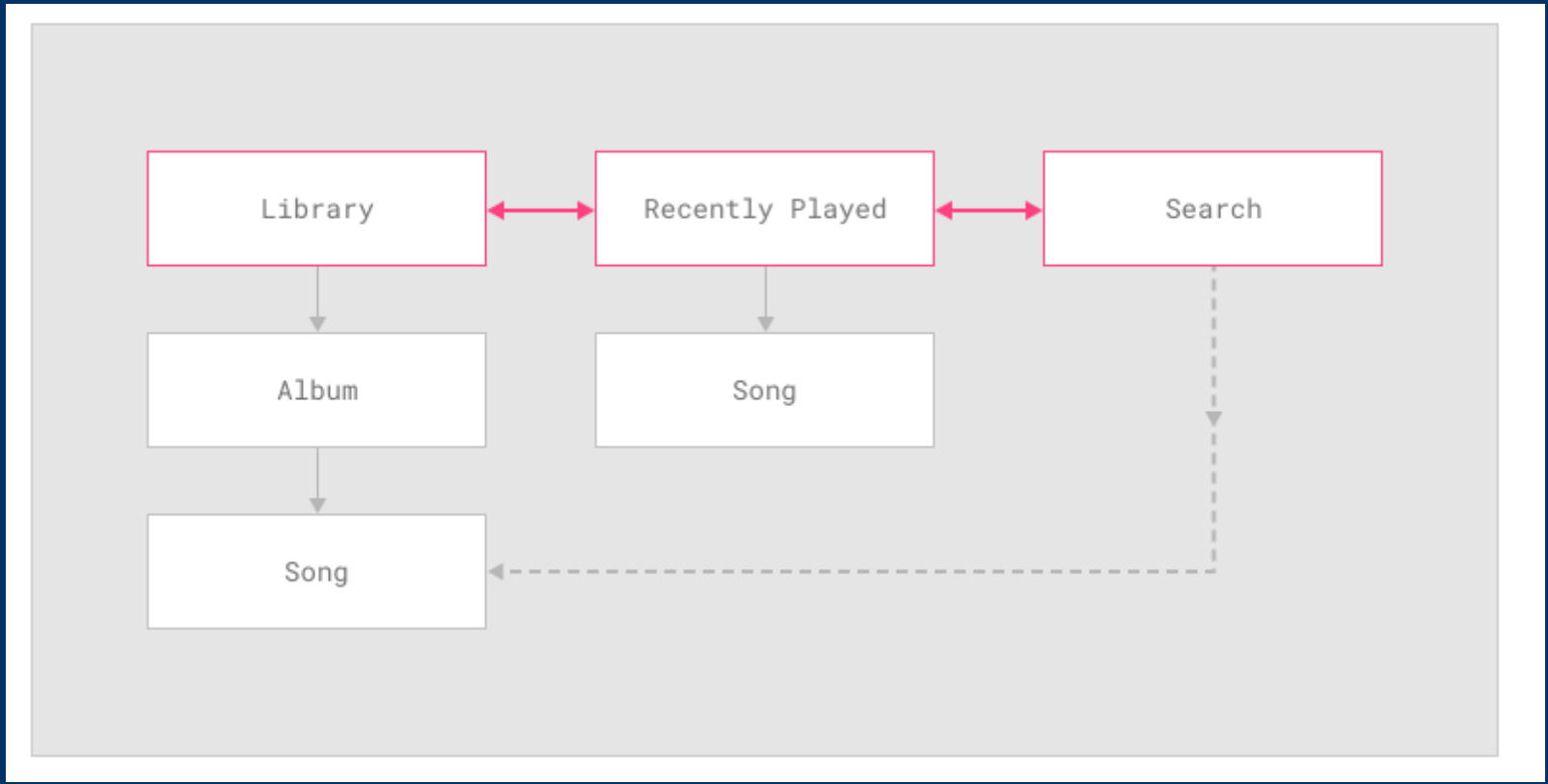
Place the user in control

5. **Show** what the program is doing



Place the user in control

6. Is **navigable**

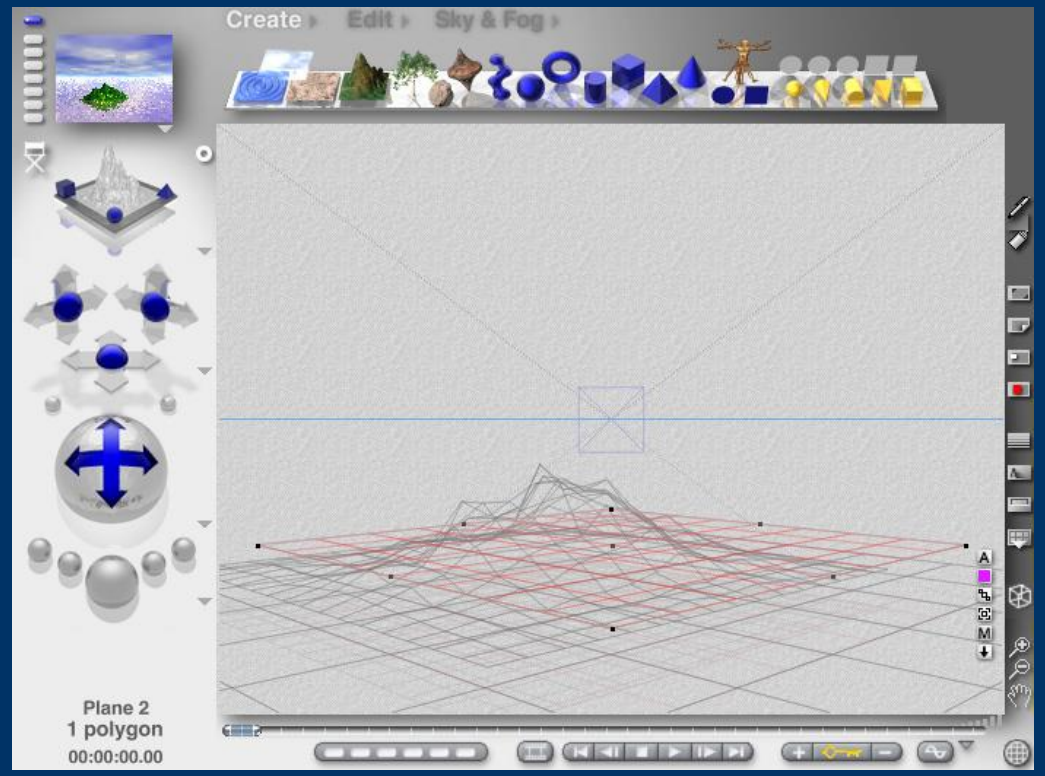


Place the user in control

7. Accommodate novice and advanced users

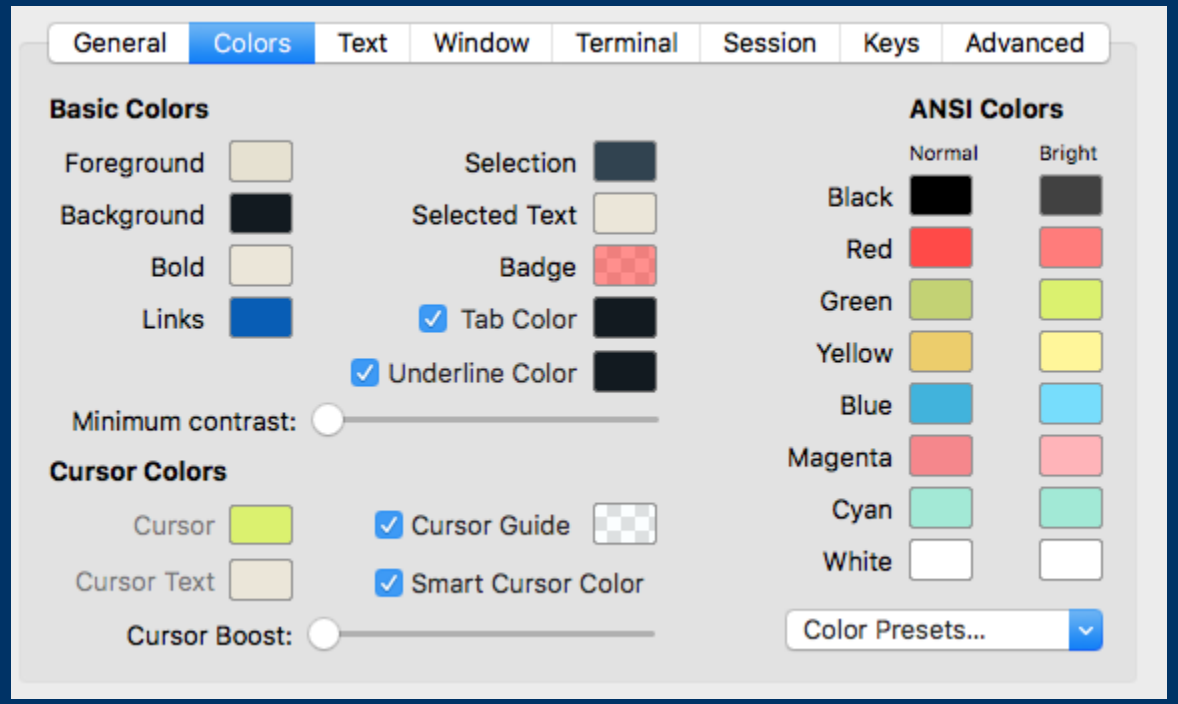
Place the user in control

8. Make the user interface operations transparent



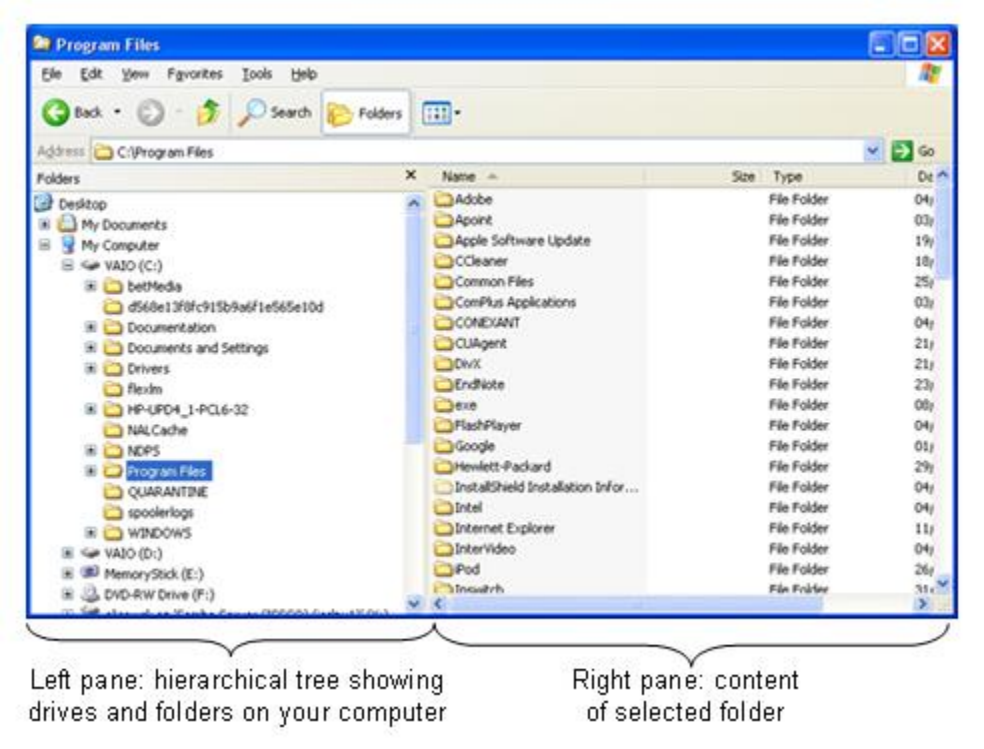
Place the user in control

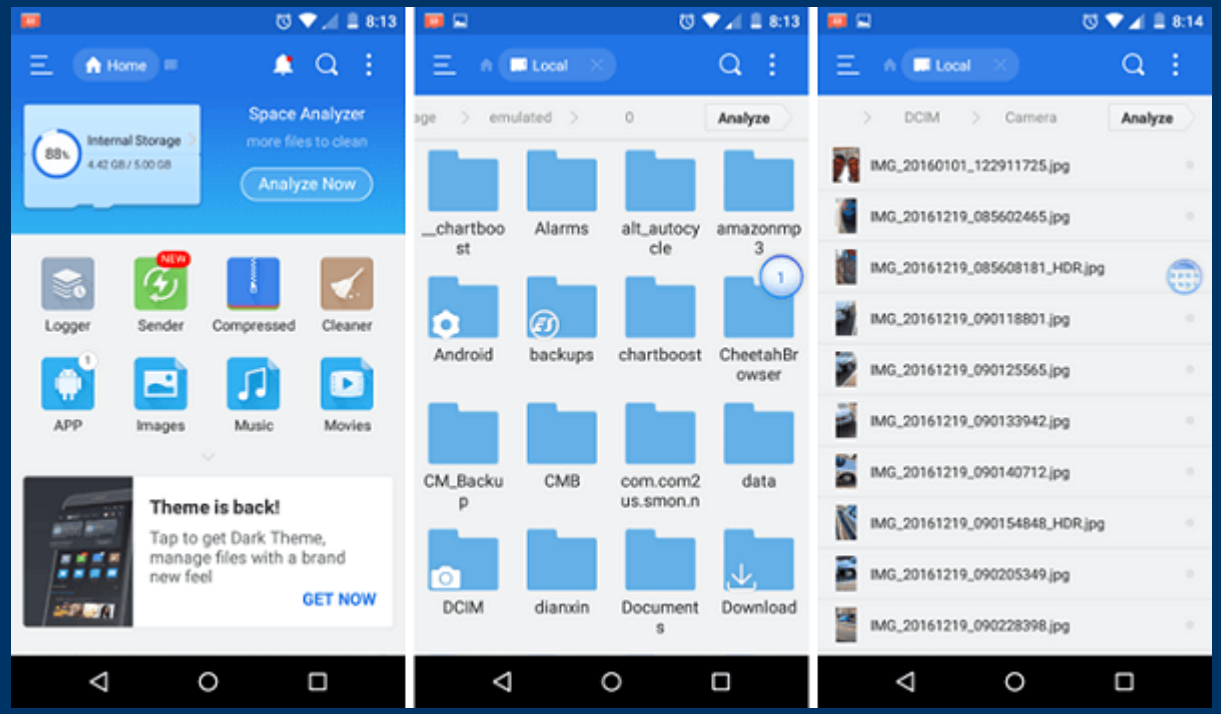
9. Allow users to customize both appearance and input



Place the user in control

10. Allow users to directly manipulate interface objects



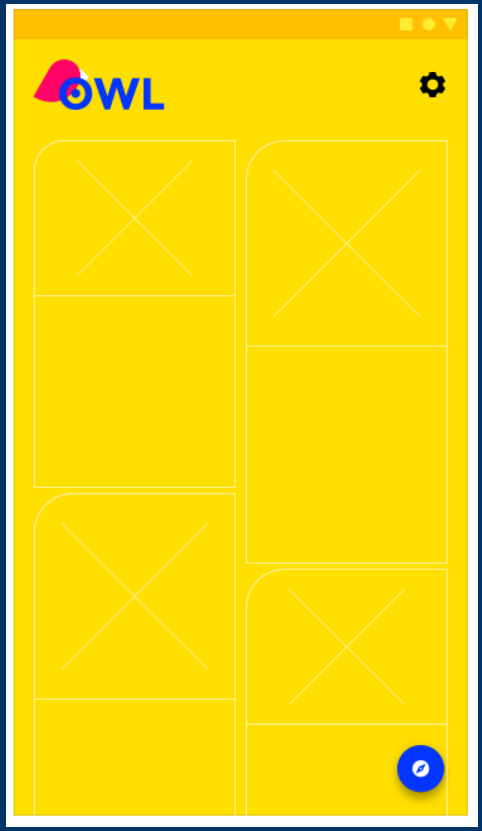


Reduce the user’s memory load

1. Relieve **short-term memory**
2. Rely on **recognition**, not recall
3. Provide **visual cues**

Reduce the user’s memory load

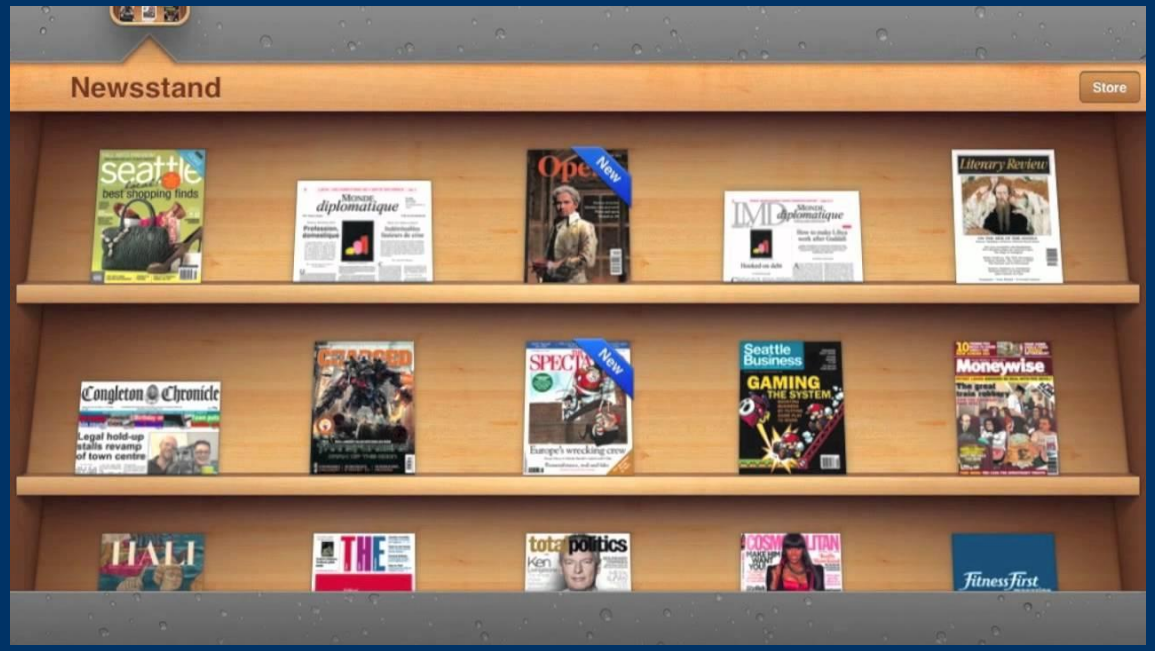
4. Provide meaningful **defaults**



Reduce the user's memory load

7. Use **real-world** metaphors

9. Promote **visual clarity**



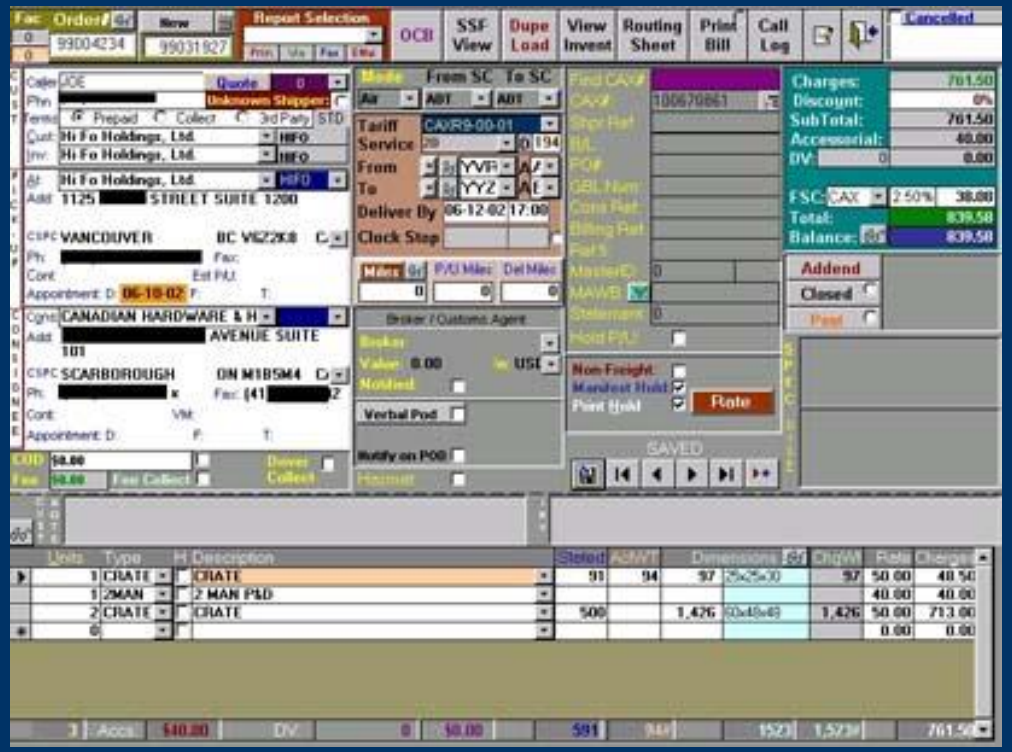
Less is more.

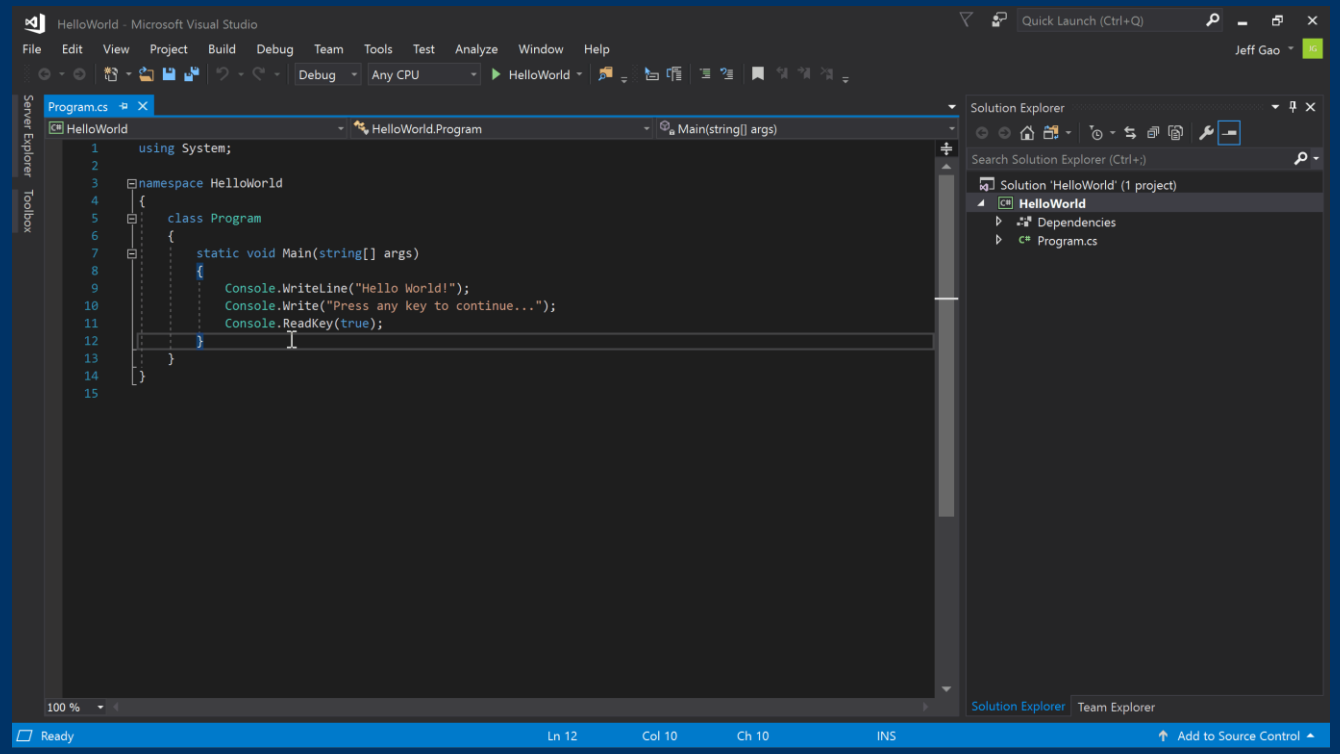
Make the user interface consistent

1. Sustain the **context** of users' tasks
2. Maintain **consistency** within and across products
3. Keep interaction **results** the same

Make the user interface consistent

4. Provide aesthetic appeal





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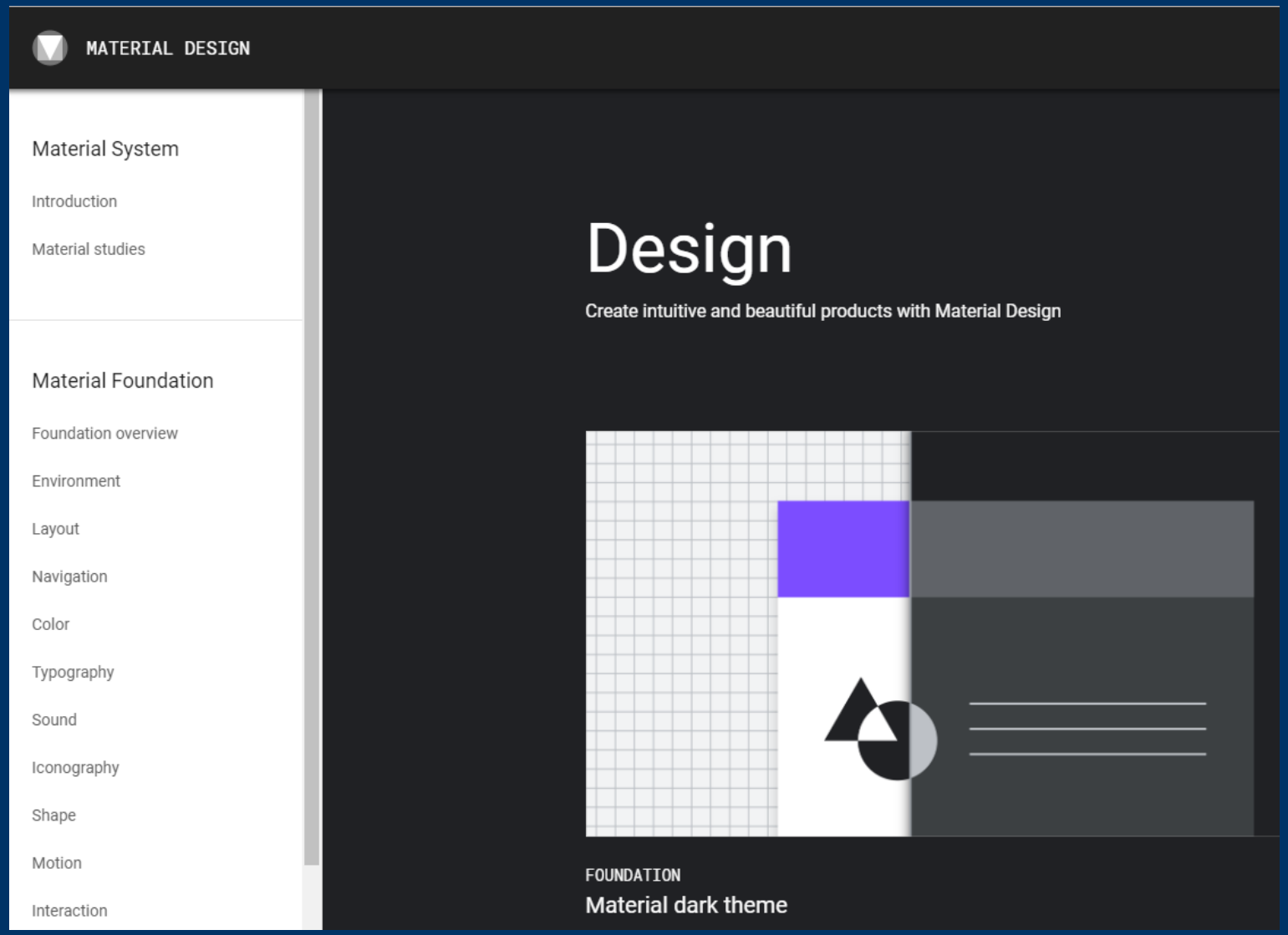
Misconceptions

Golden Rules

Material Design

LabVIEW

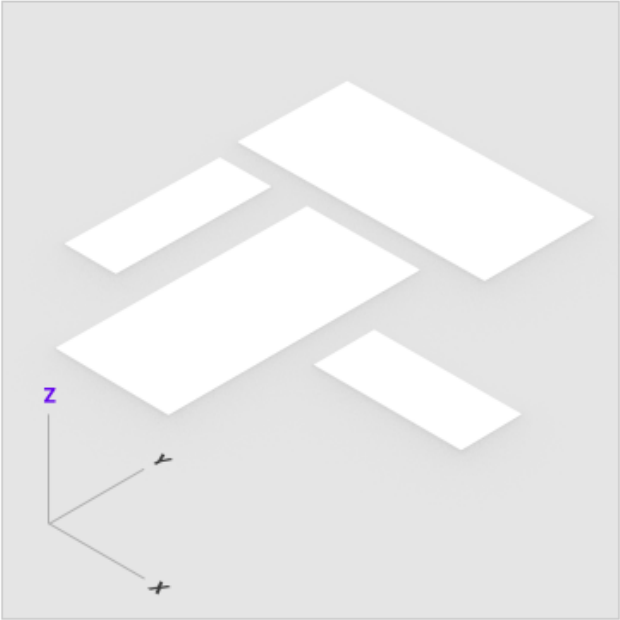
Design Guidelines



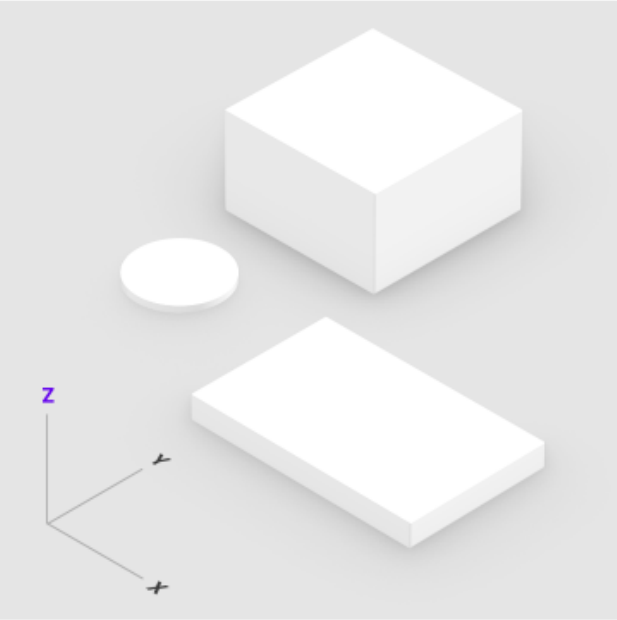
Surfaces

Dimensions

Material has varying x & y dimensions (measured in dp) and a uniform thickness (1dp).

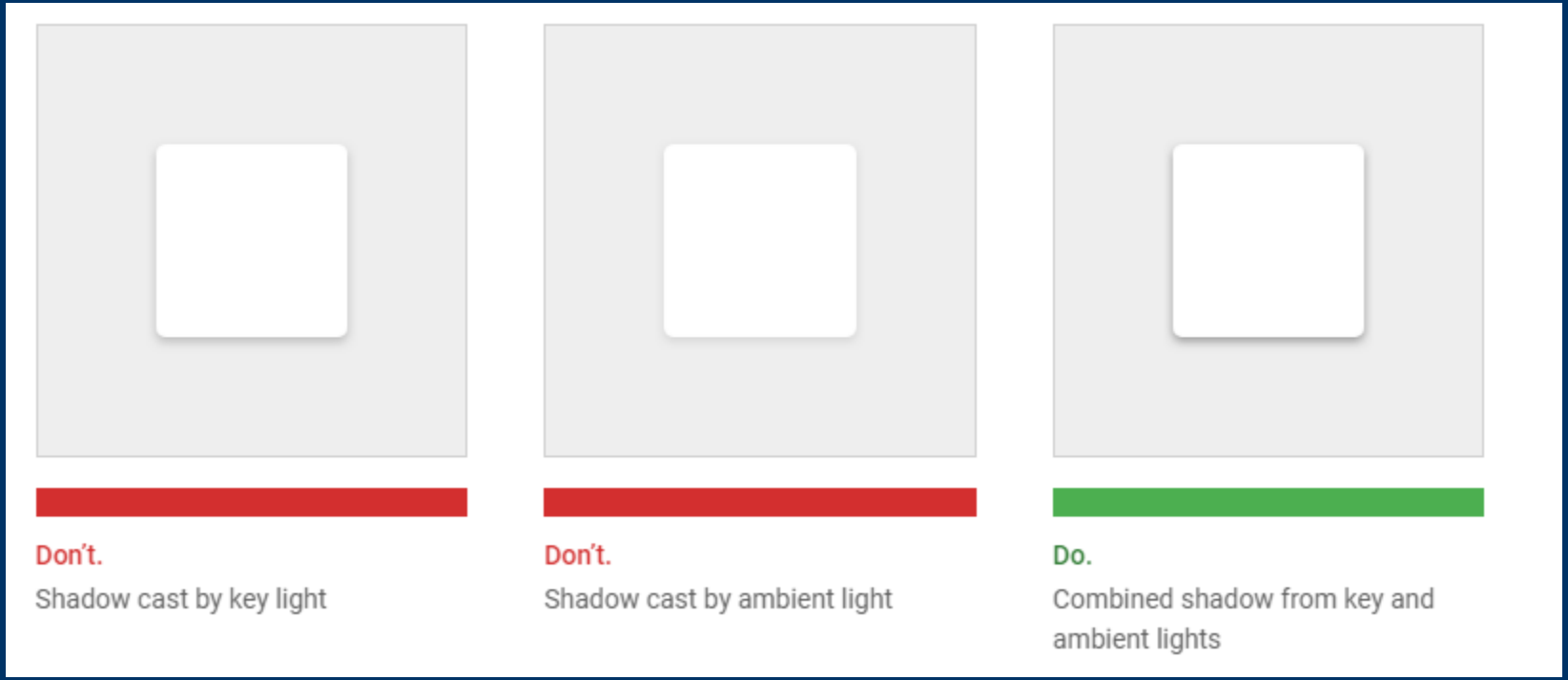


Do.
The height and width of material can vary.

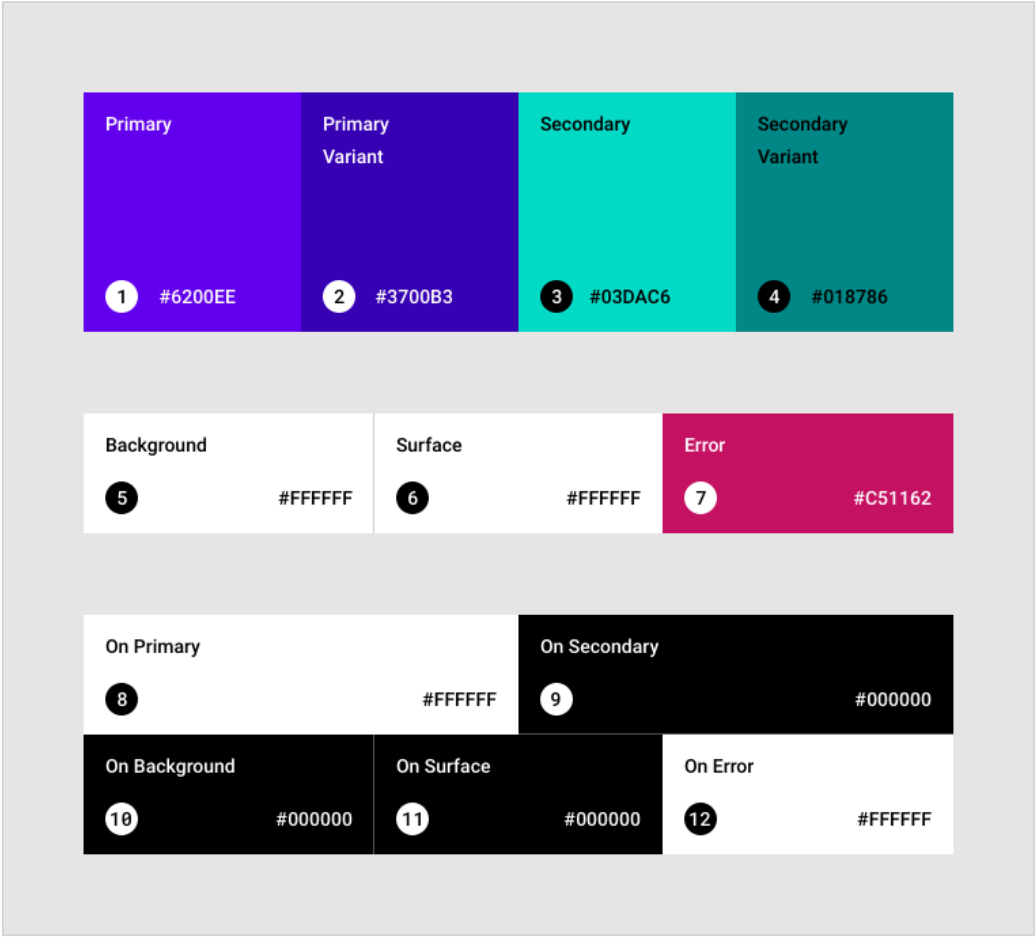


Don't.
Material is always 1dp thick.

Surfaces

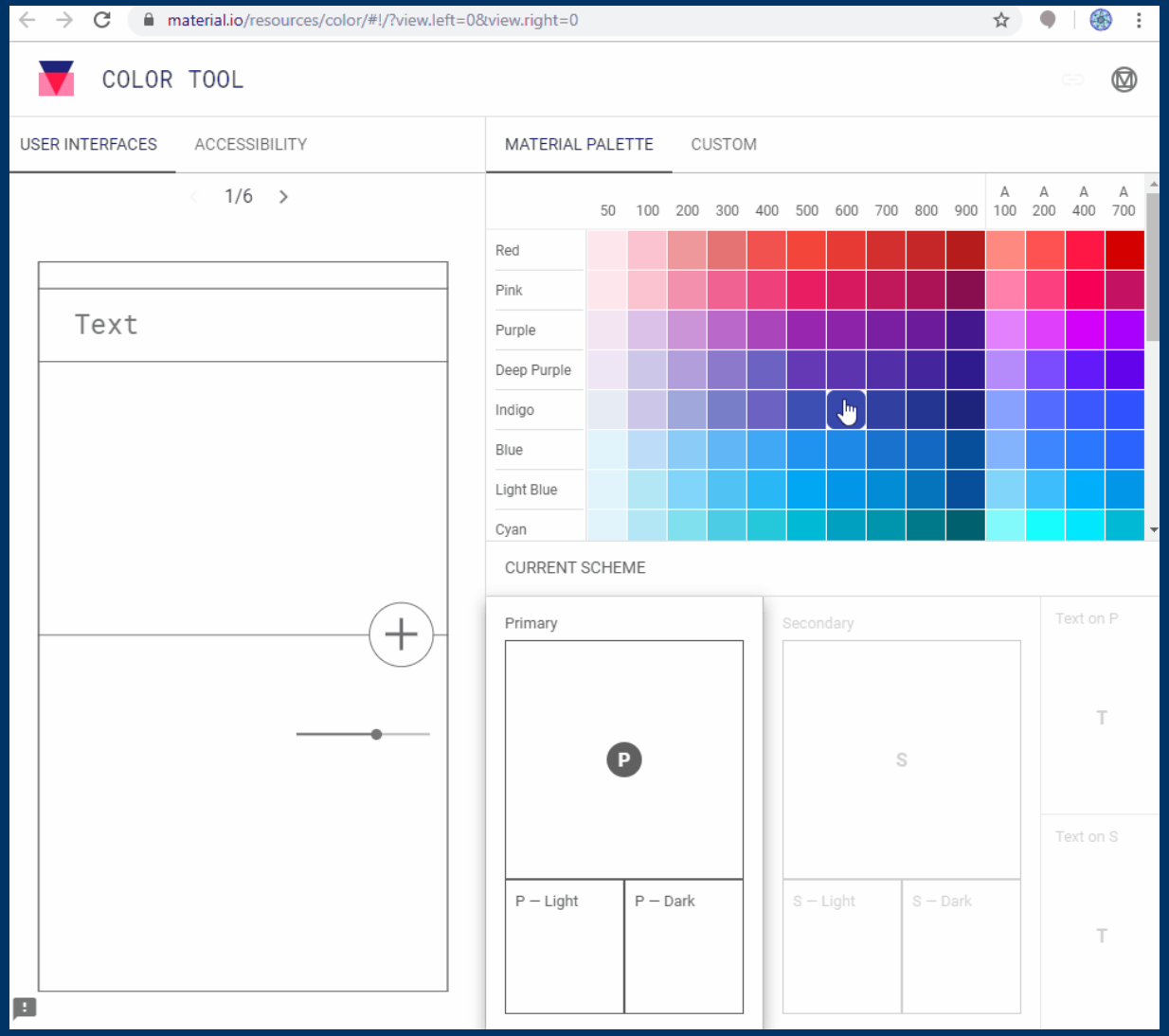

Don't.
Shadow cast by key light
Don't.
Shadow cast by ambient light
Do.
Combined shadow from key and ambient lights

Colors

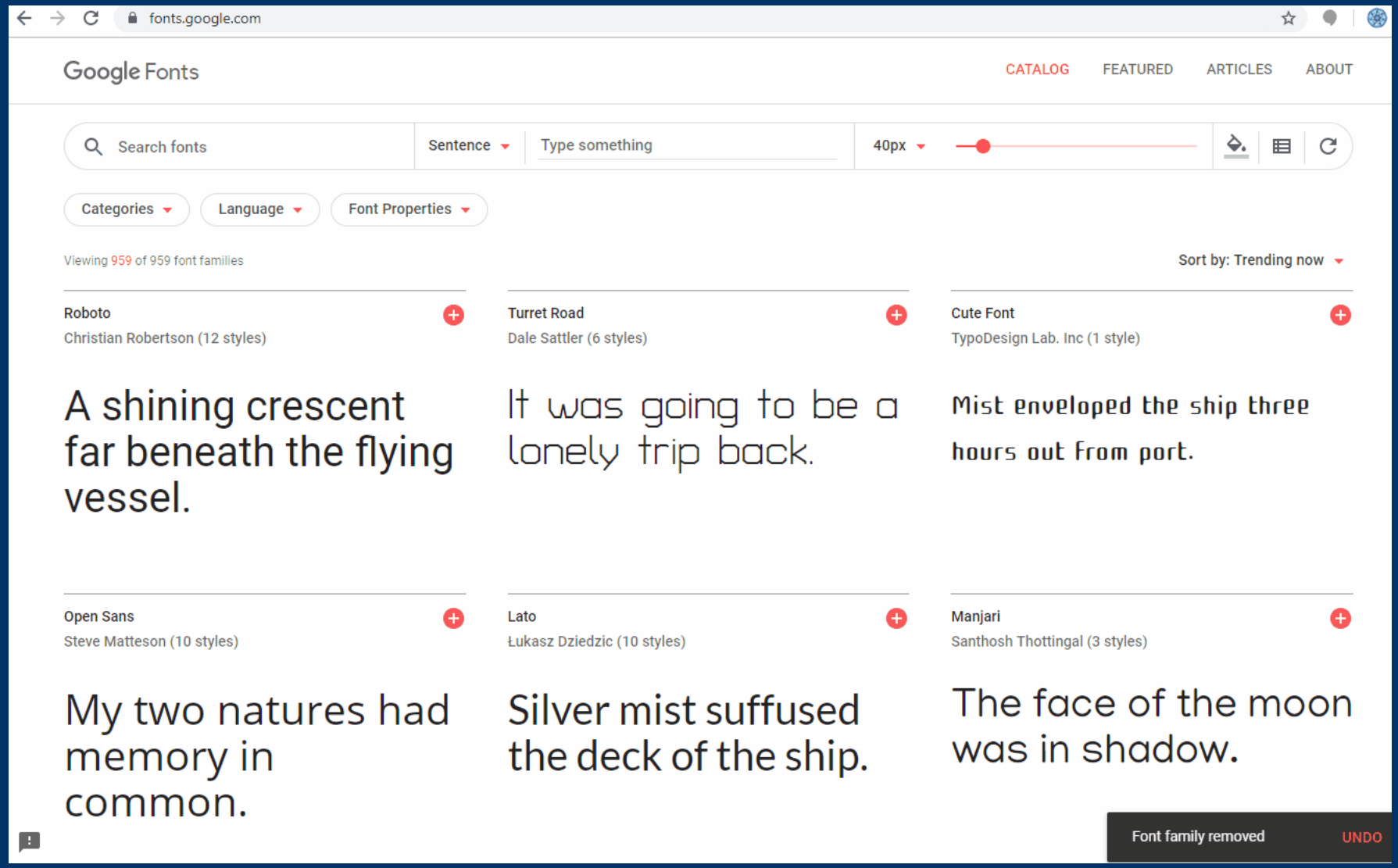


1. Primary 2. Primary Variant 3. Secondary 4. Secondary Variant 5. Background 6. Surface 7. Error 8. On Primary 9. On Secondary 10. On Background 11. On Surface 12. On Error

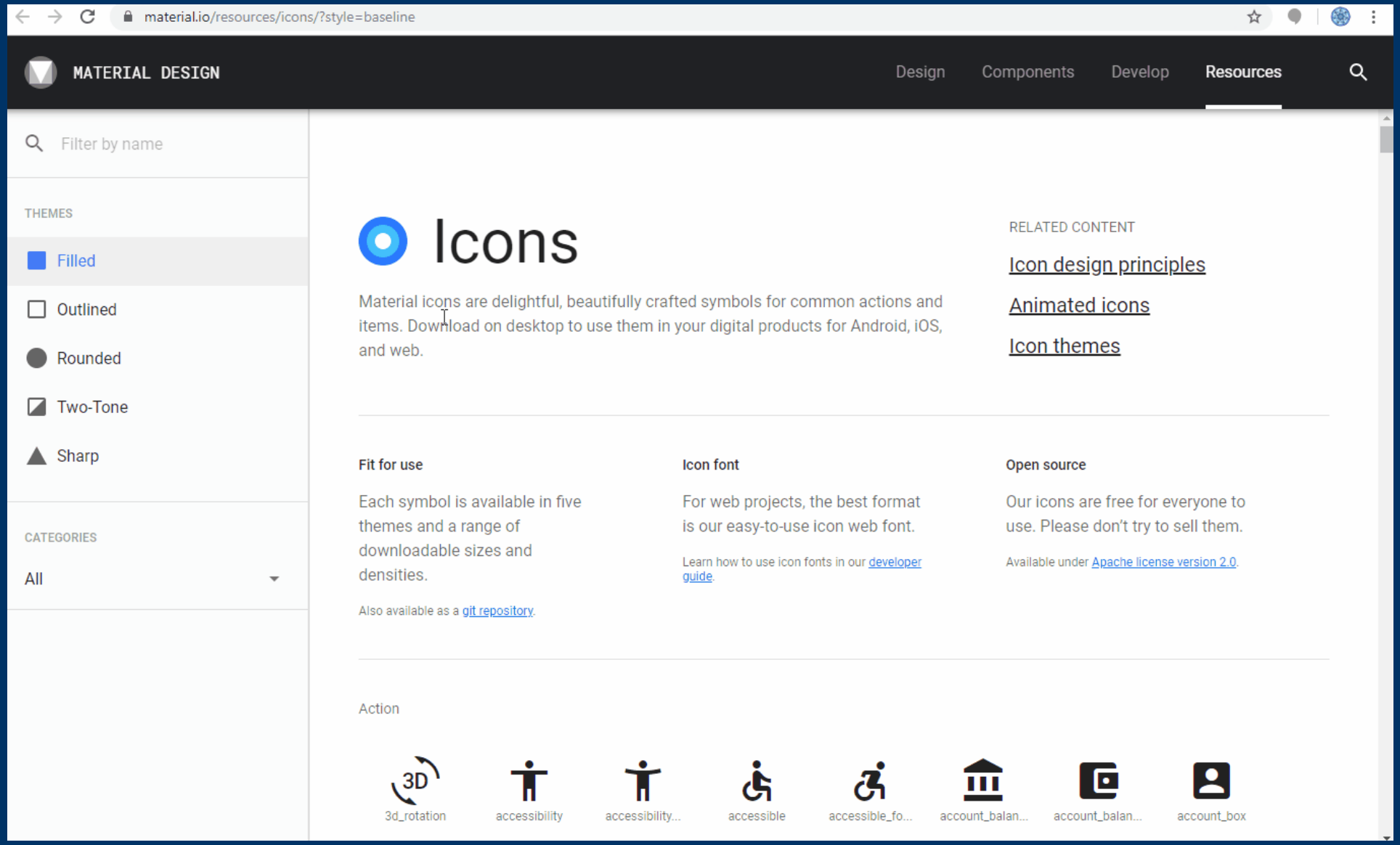
Color and Accessibility Tool



Fonts


fonts.google.com
Google Fonts
CATALOG
FEATURED
ARTICLES
ABOUT
Search fonts
Sentence
Type something
40px
Categories
Language
Font Properties
Viewing 959 of 959 font families
Sort by: Trending now
Roboto
Christian Robertson (12 styles)
A shining crescent far beneath the flying vessel.
Turret Road
Dale Sattler (6 styles)
It was going to be a lonely trip back.
Cute Font
TypoDesign Lab. Inc (1 style)
Mist enveloped the ship three hours out from port.
Open Sans
Steve Matteson (10 styles)
My two natures had memory in common.
Lato
Łukasz Dziedzic (10 styles)
Silver mist suffused the deck of the ship.
Manjari
Santhosh Thottingal (3 styles)
The face of the moon was in shadow.
Font family removed
UNDO

Icons


material.io/resources/icons/?style=baseline
MATERIAL DESIGN
Design
Components
Develop
Resources
Filter by name
THEMES
Filled
Outlined
Rounded
Two-Tone
Sharp
CATEGORIES
All
Icons
Material icons are delightful, beautifully crafted symbols for common actions and items. Download on desktop to use them in your digital products for Android, iOS, and web.
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Animated icons
Icon themes
Fit for use
Each symbol is available in five themes and a range of downloadable sizes and densities.
Also available as a git repository.
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Action
3d_rotation
accessibility
accessibility...
accessible
accessible_fo...
account_balan...
account_balan...
account_box

Components

Components - Material Design

material.io/components/

MATERIAL DESIGN

Design | Components | Develop | Resources

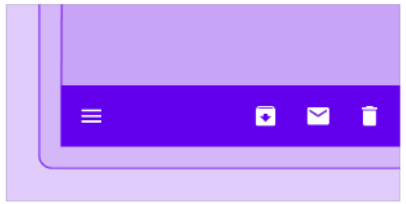
Components

App bars: bottom
App bars: top
Backdrop
Banners
Bottom navigation
Buttons
Buttons: floating action button
Cards
Chips
Data tables
Dialogs
Dividers
Image lists
Lists
Menus

Components

Material Components are interactive building blocks for creating a user interface.

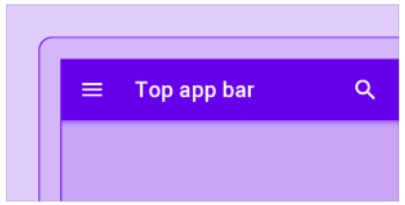
Many are available as open-source code for Android, iOS, the web, and Flutter.



App bars: bottom

A bottom app bar displays navigation and key actions at the bottom of mobile screens

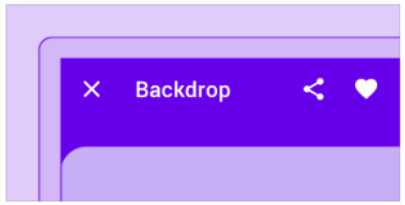
Android iOS Flutter



App bars: top

The top app bar displays information and actions relating to the current screen

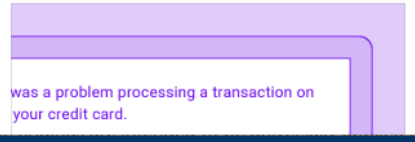
Android iOS Web Flutter

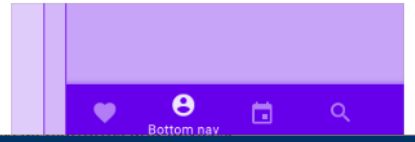


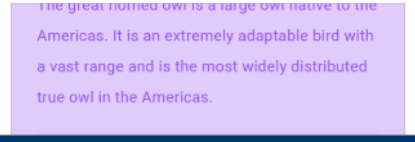
Backdrop

A backdrop appears behind all other surfaces in an app, displaying contextual and actionable content

Flutter



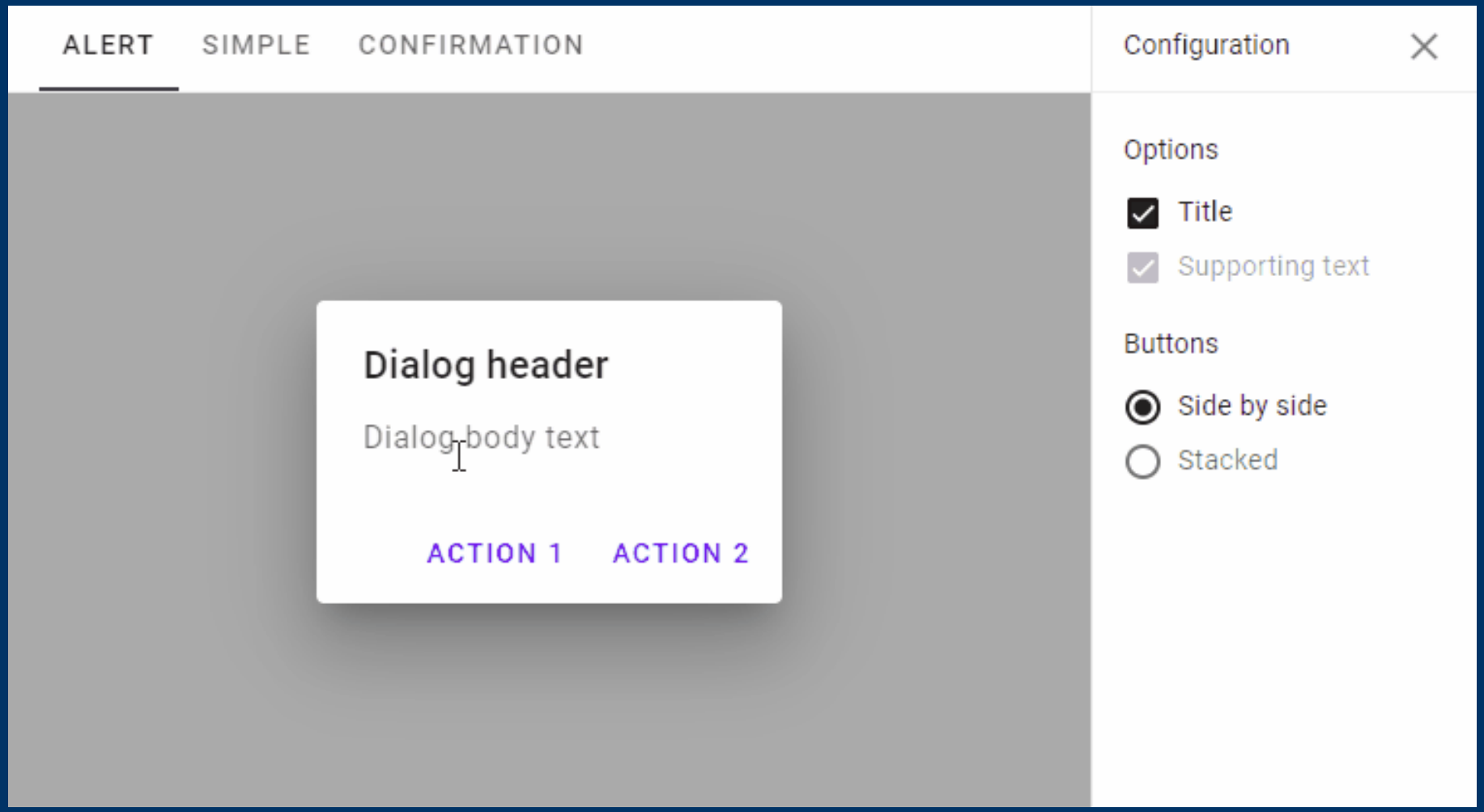




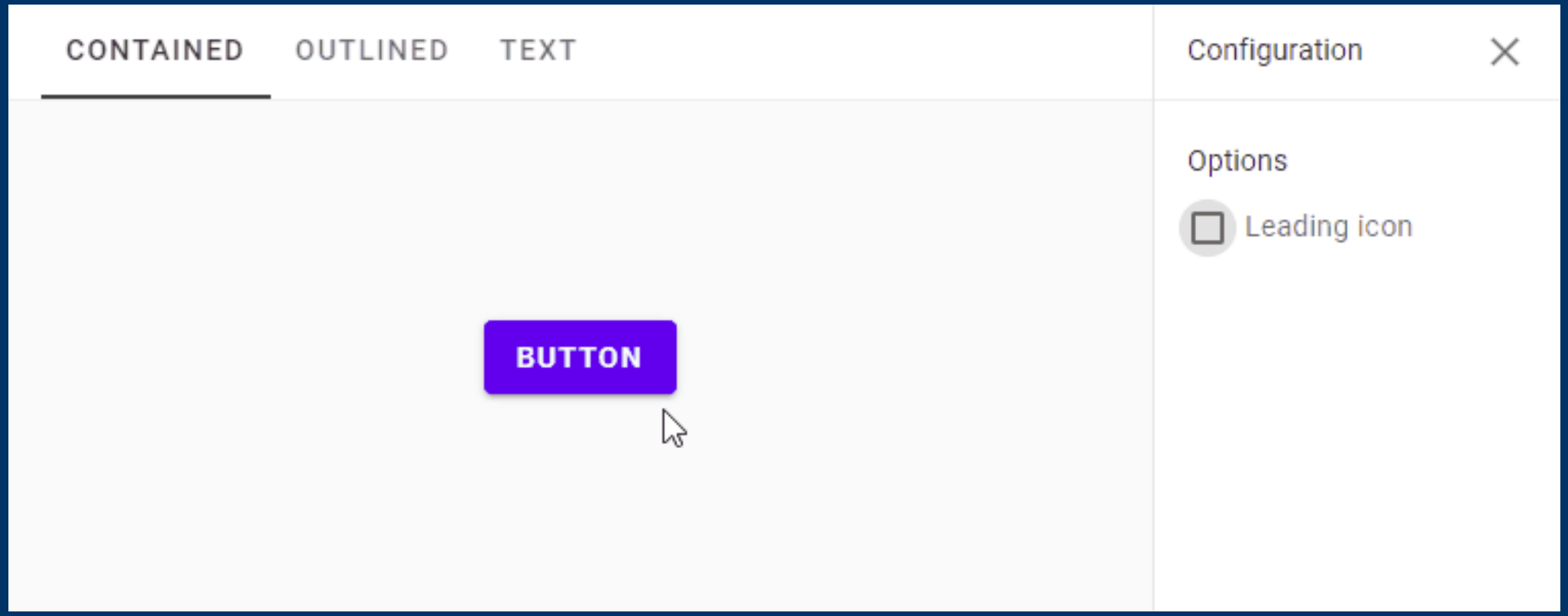
Text Fields

FILLED
OUTLINED
Label
Configuration
Options
Character counter
Leading icon
Trailing icon
Assistive text
None
Helper text
Error text

Dialogs


ALERT
SIMPLE
CONFIRMATION
Configuration
Dialog header
Dialog body text
ACTION 1
ACTION 2
Options
Title
Supporting text
Buttons
Side by side
Stacked

Buttons


CONTAINED
OUTLINED
TEXT
Configuration
Options
Leading icon
BUTTON

Definitions
Misconceptions
Golden Rules
Material Design
LabVIEW

References:

https://uxdesign.cc/we-have-lost-track-of-what-ux-actually-means-8d55259dacb0
Calgar Araz

The Golden Rules of User Interface Design
by Theo Mandel

Material Design
www.material.io

Thank you

Steve Ball
Steve.Ball@Composed.io

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